No. XIV.

HYDROSTATIC WEIGHING MACHINE.

The SILVER MEDAL *was voted to Captain* ERICSSON, 4 *Adelaide Place, London Bridge, for his Hydrostatic Weighing Machine; one of which has been placed in the Society's Repository.*

SIR,

AGREEABLY to your instructions, I beg to hand you a description of the weighing instrument which I had the pleasure to present to you last week.

In submitting this invention to the Society of Arts, permit me to observe, that the model presented was made more than a year ago, and that it has been tried under various temperatures, and always found to indicate alike.

I also beg to state, that I have been induced to claim the attention of the Society of Arts only from a strong conviction that the peculiar features of my hydrostatic weighing instrument cannot fail to render it of much utility to the commercial community, by greatly facilitating the business in docks and warehouses: to carriers, in particular, I believe it cannot fail to be a welcome present.

I am, Sir, &c. &c.

T. ERICSSON.

A. AIKIN, Esq.
Secretary, &c. &c.

The object of this invention is that of dispensing with the use of weights, in all ordinary weighing in which ounces are not counted. The principal features are:

1. That the instrument is not subject to any friction; hence, that its accuracy is not, like the balance, affected under heavy weights.

2. That the motion of the parts is almost imperceptible, wear and tear being thereby prevented.

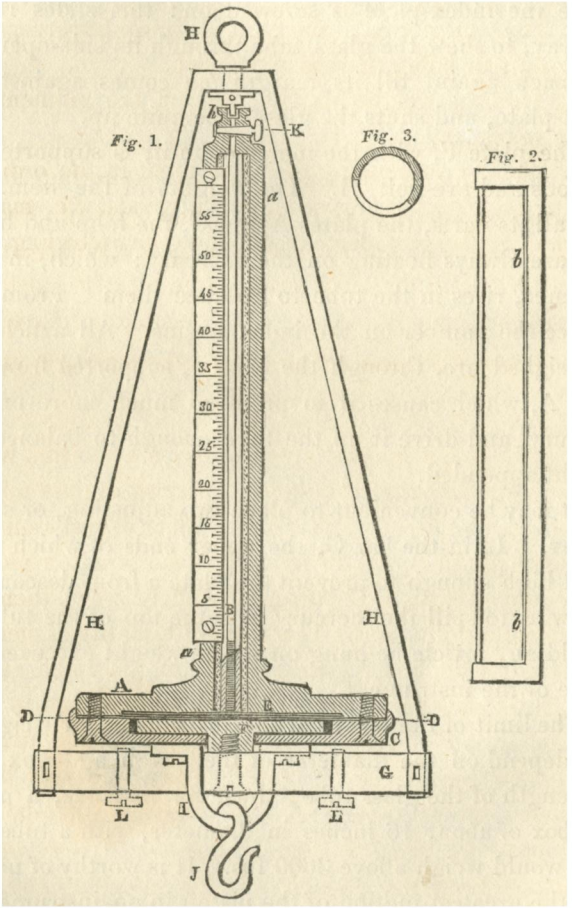
3. That the weight may be read off the moment the article is suspended.

4. That by suspending the instrument in the ordinary hoisting tackles, the precise weight of goods, &c. may be obtained by the very process of loading or unloading.

Description of the annexed drawing, representing a section of the model.

Fig. 1. A is a shallow inverted box of cast iron, with a hollow stem *aa;* into this stem is inserted a glass tube B, bedded in plaster of Paris. C is a plate of cast-iron with a wide recess in it, firmly secured to the box A, a piece of India rubber cloth D D being inserted between them, so as to form a tight joint. E is a small quantity of mercury contained in the box A, and resting on the India rubber cloth D D; this being supported by, and fixed to, a plate or piston F. This plate rests on, and is firmly attached by a screw to, the under cross-bar G; and this bar is suspended by two rods H H, and the swivel eye-bolt H, which is partly inserted into, and made to slide in, the stem *aa* at *h*. I is a loop fixed to the bottom of the plate C, without touching the cross-bar G; it has a hook J correctly under the centre, to which hook the article to

be weighed is suspended. K is a small stop-cock, which may be shut whenever the instrument is not in use; it will prevent any mercury from escaping when moving the instrument, or should it chance to be placed in a horizontal position.



Rather more than one quarter of the circumference of the stem *a a* is cut away, to shew the tube, and let the

rise of the mercury be seen, the index-plate is screwed to one side of the opening. Though the glass tube is protected by nearly three-quarters of the stem *a*, yet a further security is provided for it when out of use. A tube like fig. 2, and 3 its section, is slid over the stem before the index-plate is screwed on: this slides round one way, to shew the glass tube through its side-opening, and back again, till its margin *b b* comes against the index-plate, and shuts the glass tube quite up.

The plate F, with the mercury on it, is supported by the rods and eye-bolt, H. The weights of the stem, *a a*, with all its parts, the plates A and C, the loop and hook, I, J, are always floating on the mercury; which, in consequence, rises in the tube to balance them. From this surface the number on the index begins. All articles to be weighed are, through the hook J, supported from the plate A, which causes it to press so much more on the mercury, and drive it up the tube enough to balance the weight appended.

It may be convenient to place two adjusting, or safety screws, L L, in the bar G, the upper ends of which shall stand high enough to prevent the plate *c* from descending so low as to spill the mercury over the top of the tube B, should any article be hung on whose weight exceeded the range of the instrument.

The limit of the power of the instrument for weighing will depend on the diameter of the piston and box, and the length of the glass tube; thus, for instance, a piston and box of about 16 inches in diameter, with a tube of 3 feet, would weigh above 3600 lbs. It is worthy of notice, that the greatest motion of the piston in an instrument of this size will only amount to $\frac{1}{100}$th of an inch.

The effect of changes in the temperature will, evi-

dently, be an increase or diminution of the specific gravity of the mercury: this will, however, not affect the accuracy of the indication, for, though the mercury dilates more than the materials of which the box and piston are composed, still it can only affect the indication in a direct proportion to its expansibility; whereas the dilatation of the box and piston will counteract in proportion to the square of their expansibility. A slight error in the indication still remains, which will be completely corrected by fixing the index-plate at its lower end only, allowing the top free motion during changes of temperature. Regarding the construction of this instrument, it is of importance to make the bore of the glass tube, in all cases, $\frac{3}{16}$th of an inch, and the space between the circumference of the piston and the box should never exceed that dimension, however large the instrument may be.